PROPERTY PLANNING COMMON ELEMENTS

COMPONENTS OF MASTER PLANS

HABITATS AND THEIR MANAGEMENT

Water Level Manipulation

Description

Water level manipulation refers to the planned manipulation of water levels in impounded wetlands (wetlands in artificial standing water bodies) to meet specific resource management objectives. Healthy natural wetlands have evolved with, and are adapted to, periods of flood and drought. In impounded wetlands where water control structures are present, managers have the ability to mimic these disturbance regimes by manipulating water levels, thereby benefitting associated plant and animal communities. Water level manipulation typically involves a drawdown (lowering of water levels) with a specific onset and duration followed by a water level increase. The frequency, intensity, and timing of water level changes are critical factors in achieving the desired plant community response and habitat conditions for different species or groups of wildlife. Managers should carefully assess the characteristics of the impoundment (e.g., size, shape, outlet, watershed, etc.) and articulate clear management objectives when planning water level changes.

Water level manipulations on DNR lands often are used to reinvigorate native wetland plants, control or eliminate undesirable species, particularly non-native invasives, and create or enhance habitat for nesting and migrating waterfowl, waterbirds, and shorebirds. A large drawdown often can greatly increase waterfowl and waterbird use of a wetland. Drawdowns should only occur during the growing season when ice is not present. Following a drawdown, managers should carefully plan the timing and rate at which an impoundment fills up to full capacity. Mudflats with moist soil and shallow water provide ideal foraging conditions for migrating shorebirds during the late summer, yet deeper water should be present in the impoundment by early fall as migratory waterfowl begin to move through, and water levels should be stabilized by the end of October before reptiles and amphibians are seeking overwintering sites.

Considerations

- Drawdowns can vary from a few inches to total elimination of surface water. Complete drawdowns are most beneficial to increase the density and distribution of emergent aquatic plants. Partial drawdowns benefit submergent plants and concentrate food resources, increasing foraging efficiency for waterbirds, waterfowl, and shorebirds.
- Low water levels going into winter can limit undesirable fish by increasing winterkill, but can also negatively impact overwintering herps.
- Different plant species benefit most from drawdowns at different points in the growing season. Lower water levels in spring and early summer benefit bulrushes, while cattails benefit most during mid-to-late summer. Submergents benefit throughout the growing season, although the first third is the most critical.
- Most shorebirds prefer water depths ranging from less than an inch to about 4 inches, areas with <25% vegetation cover, and vegetation that is <6 inches in height. Drawdowns and reflooding should be slow and gradual to mimic the natural wet-dry cycles of seasonal wetlands.

- To avoid negative impacts on herps, avoid dramatic drawdowns during the active breeding season, initiate fall drawdowns earlier, avoid winter drawdowns, and consider whether the target wetland is the only suitable habitat for herptiles in the area when planning a drawdown. One or more satellite wetlands that are safely accessible should have adequate winter water levels extending into the following spring and summer to serve as alternate refugia. Consider using silt fencing or another barrier to redirect animals escaping a drawdown away from roadways and towards more suitable habitat.
- Avoid rapid drawdowns to minimize the release of sediments and erosive forces of water downstream.
- Consider the current status of the water table and surface water budget before releasing water downstream.
- Consider precipitation forecasts and potential spikes in the hydrograph when planning the timing of drawdowns and how much water is released.
- Understand the hydrologic needs and conditions of downstream neighbors and land uses when planning whether and how drawdowns will be conducted.